Aviation Scribe
By Bill O'Brien

History was my best subject in high school. No doubt because it was the sole class in four years in which I wasn't on the back side of the learning power curve. I maintained a good grade in history because I realized early in my freshman year that history was a record of mankind with all the facts and dates laid out in chronological order.

Dedicated men (scribes) painstakingly recorded their present day events for posterity. They knew that by leaving a permanent written record behind, their era's accomplishments, wisdom ,and folly would never be lost or forgotten. We owe these forgotten men a debt we cannot repay.

A&P technicians are also scribes. Aviation scribes. If you look in an aircraft's logbook, be it a Boeing 777 or J3-65 Cub, the vast number of entries in an aircraft's logbooks are done by technicians who chronicle the aircraft's maintenance history. But unlike the scribes of yore, the technician who signs the logbook is usually the one who performed or supervised the maintenance that was accomplished.

It goes without saying that the Federal Aviation Regulations (FARs) have placed some limits on aviation scribes on what can and cannot be entered into an aircraft's logbook. The following is a review of these limitations:

There are basically three FARs that form the core requirements for maintenance record entries: FAR Part 91, Section 91.407, and Part 43, Sections 43.9 and 43.11.

Before we look into each particular rule's bureaucratic requirements for maintenance entries, I can safely state the unwritten FAR, known as the four "C" rule, requires that each maintenance entry must be clear, correct, complete, and credible. Follow the four "C" rule and everything else should fall into place.

Back to the written rules.

The first rule we are going to examine is for the owner or operator of the aircraft – Part 91, Section 91.407. This rule basically says that the aircraft cannot be operated unless a maintenance entry is made by an authorized person in accordance with Sections 43.9 or 43.11. Or to put it more candidly, "If any person authorized under Section 43.7 to perform work has not returned it to service via a logbook entry, the owner or operator can't fly it!"

As part of their flight training many general aviation and corporate pilots have imprinted into their DNR that they cannot fly their aircraft unless the annual inspection, routine or nonroutine repair work has been signed off by a technician or IA.

What most pilots do not realize, as one of the persons authorized under Section 43.7 to make a logbook entry, is how much trouble they can get into if they fly the same aircraft on which they themselves have performed preventive maintenance and did not sign off the work in the logbook. Some pilots seem to think since they fixed it, and because it's their aircraft, that they do not have to approve the work for return to service. They're wrong! The exact same rules apply to them as it does for any technician performing maintenance.

This missing maintenance entry can create a real problem for a technician or IA who last signed the aircraft's logbook. Let's take a look at the following example:

A technician as part of an annual inspection checks the tires and brakes, replaces the brakes, and tells the pilot/owner that the left main tire should be replaced within the next 50 hours.

The following week in his own "T" hangar the pilot changes the tire himself. He is a firm believer that if snug is good, then tight is better. He over torques the wheel bearing nut. As usual, he makes no record of the work he performed. On the first landing since the annual inspection, the bearings seize up 100 feet after touching down, the wheel locks up, and the aircraft skids and turns abruptly, drops a wing, and then cartwheels, catches on fire and burns, and the pilot dies of injuries.

Who is the NTSB prime suspect for the cause of the accident? The technician, of course. Wasn't he the one who signed the logbook last? The technician's logbook entry even records that he was the one who took the wheel off to replace the brakes. In many cases the technician's actions are considered the probable cause of the accident by the NTSB.

Even if the accident is ruled as pilot error by the NTSB, the technician will always remember looking at the skid marks on the runway and wonder if he is responsible for another man's death because he forgot something, or did something wrong. No one deserves to be left with a millstone of guilt around his or her neck simply because an entry that takes 30 seconds to make wasn't made in a logbook.

We have to educate the pilot community about this logbook entry requirement. If you run across a pilot performing maintenance on his aircraft, gently remind him or her that all the rules which apply to technicians also apply to pilots.

These rules are as follows:

Rule #1: How the work must be performed

If you carry your FARs in your back pocket, you might want to show a pilot working on his own aircraft Section 43.13 performance rules, paragraphs (a) and (b).

Run your finger slowly over the part in paragraph (a) where it requires the person performing the maintenance to use the current manufacturer's maintenance manual or Instructions for Continuing Airworthiness. Next, kind of crease the paper under the next sentence of the rule with your fingernail that states that the person performing maintenance shall use the tools equipment and test apparatus necessary to assure completion of the work in accordance with accepted industry practices.

After making quick eye contact, check to see if the lights are still on, slide down to paragraph (b), and casually mention that the work must be performed in such a manner and of such quality that the product worked on will be equal to its original or properly altered condition.

I might mention here that some technicians, including myself, were taught in the late 1960s that all our work must "be equal to" or "better than" the original. I was rehabilitated back to the true regulatory path in 1986 by my first FAA mentor, Chuck Schaffer. He told me that if I've made the work better than the original, I've altered it — and a Form 337 may be required.

Rule #2: Maintenance entries

The rule for making a maintenance entry is Section 43.9. It requires the technician performing maintenance or the pilot performing preventive maintenance provide the following information in the maintenance entry:

1. A description or reference to data acceptable to the administrator of the work performed.
2. The date of completion of the work performed.
3. The name of the person performing the work if other than the person who signs the approval for the return to service.
4. A person authorized under Section 43.7 approves the aircraft or component part for return to service.

A typical entry can look like this:

N 1995T AIRFRAME LOGBOOK PAGE 53

JANUARY 5, 1997, TACH TIME: 1423.3 HOURS,
DRAINED LEFT MAIN FUEL TANK AND REPLACED THE LEFT MAIN FUEL TANK PROBE, WITH NEW FACTORY SUPPLIED PART (PN: P78946-23). TANK REFILLED, PROBE AND COCKPIT FUEL GAUGE CALIBRATED, AND LEAK CHECKED

OK. ALL WORK WAS PERFORMED IN ACCORDANCE WITH AIR-O-DYNE AIRCRAFT MAINTENANCE MANUAL, CHAPTER 6, PAGES 112-113, REVISION 5. ALL WORK PERFORMED BY RUSTY RIVETS.

PATRICK POTEEN
A&P 1809539

There are several things I want to point out about this sample entry. First, I've added the tach time. It is not required by the rule, but it sure can come in handy when researching a logbook. The second item that I recorded was the latest revision to the manual that I was using to perform the work. This tells the world the technician is familiar with the requirement in Section 43.13 in which a technician or pilot must use the "current" manufacturer's instructions. Using the manual's revision date or number usually satisfies this requirement.
The third item was identifying the person who was working under the technician's supervision. However, I should mention that pilots do not have the privilege to supervise preventive maintenance; they must perform it themselves.
The last point I want to make is the rule under paragraph (4) is very specific and states that a signature of the technician or pilot constitutes an approval for return to service – but only for the work performed. Therefore, it is quite possible for a technician to perform the task identified above, sign the repair off as airworthy, and the rest of the entire aircraft is a basket case.
The question that is asked now is: "How long is the technician or pilot going to be held responsible for the work performed?"
The answer is: Until that maintenance is superseded, altered, removed, replaced, or inspected. This period of culpability varies but usually is approximately a year or to the next annual inspection.

Rule #3: Inspection entries
Inspections must be recorded in accordance with Section 43.11. This rule provides the individual performing the inspection with the procedures on how to make a permanent record that either approves or disapproves an aircraft or component part for return to service.
Note that there are about as many kinds of inspections as air carrier aircraft waiting in the penalty box at Chicago's O'Hare on a Friday afternoon. There are annuals, progressives, 100-hour, 50-hour, prepurchase, lightning strike, corrosion, hard landing, water emersion. However, they all share the same requirements for a logbook entry.
The entry must list:
1. The type of inspection and a brief description of the extent of the inspection.
2. The date of the inspection and the aircraft's total time in service.
3. The signature and certificate number of the person who approves or disapproves the aircraft or component part returned to service.
Since there can be hundreds of kinds and types of inspections, I will discuss the most popular type of inspection, the annual. The logbook entry for annual inspection that declares an aircraft airworthy looks like this.

N1995T AIRCRAFT LOGBOOK PAGE 53

JANUARY 5, 1997, HOBBS TIME: 1723.9 HOURS
I CERTIFY THAT THIS AIRCRAFT HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AND WAS DETERMINED TO BE IN AIRWORTHY CONDITION.

PATRICK POTEEN
A&P 1809539 IA

There are a few things that I would like to point out about this entry:
First, is the requirement for total time. Total time, as per FAR Part 1 definition, says that total time is the time the aircraft leaves the ground and returns. Hobbs time, tach time, pilot's recorded flight time in the logbook are acceptable means of recording total time.
However, please do not mix up total time by using Hobbs time today, tach time next week, and Eastern Standard Time next month. If you started with tach time, stick with it. If for some reason you want to switch to a Hobbs meter or some other recording device, then make a logbook entry. But be sure that this new way of keeping total time would not jeopardize the timely replacement of any life limited parts on the aircraft or recurrent inspections required by an airworthiness directive or the aircraft's maintenance program.
The second thing that I would like to point out is how powerful the meaning of the words are in the above statement, for example, the word "I." "I" is your basic personal pronoun and is common as warm dirt in the English language. However when it is attached to the word "certify," it means that an annual inspection cannot be performed by anyone except the IA who signs the inspection off. Another powerful word is "aircraft." In this statement, it means the entire aircraft and its installed equipment is ready for flight. This means the IA must inspect the entire aircraft, including any special inspection requirements listed in the applicable STC's manual for continuing airworthiness. One more example of a powerful word is "airworthy," which means the aircraft meets its type design and is in a condition for safe operation. When tied together, "I certify," "aircraft" and "airworthy" give a technician/IA no "wiggle" room. This recommended statement in Section 43.11 is clear, correct, complete, and creditable.
While we are on the subject of creditable, the FAA has another rule, Part 43, Section 43.12 that talks to falsification, reproduction, or alteration of maintenance records. This rule states that any person who intentionally falsifies a maintenance record or report, or reproduces a record for fraudulent purposes or alters a maintenance record for a fraudulent purpose is putting his or her certificate at great risk.
If you're caught, you'll spend some uncomfortable time with the FAA, and if the charges against you are indeed true you could also wind up talking to a guy in wing tips, and a narrow tie who just flashed you his FBI badge.

Common Questions

The following are a few of the more common questions I've fielded related to logbook entries:
How long is a technician/IA held responsible for an aircraft inspection he or she performed?
The technician/IA is held responsible for the "airworthiness" of the aircraft until the ink on his or her signature dries.
This is because the technician/IA makes an airworthiness determination at a single moment in time which he identifies with a date and total time entry. The FAA realizes that since the technician no longer controls the aircraft once it leaves the technician's care, he or she cannot be held responsible for the aircraft's future state of airworthiness.
The downside of signing off an annual/100-hour/or progressive inspection is that the technician/IA takes on the responsibility for the airworthiness, all repairs, all alterations, all ADs that were performed, all inspections that were completed by all the technicians/IA, back to the time the airworthiness certificate was issued to the aircraft, be it six months ago, six years ago, or 60 years ago.

Another common question is:

What happens if the aircraft or component part is unairworthy?
Part 43, Section 43.11 (a)(5) provides a sample entry:

N1995T AIRFRAME LOGBOOK PAGE 53
JANUARY 5, 1997, TOTAL TIME: 2006.3 HOURS
I CERTIFY THAT THIS AIRCRAFT HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AND A LIST OF DISCREPANCIES AND UNAIRWORTHY ITEMS DATED 1/5/97 HAVE BEEN PROVIDED FOR THE AIRCRAFT OWNER OR OPERATOR.

PATRICK POTEEN
A&P 1809539

The FAR does not require the list of discrepancies be included with the logbook entry. On the other hand, it does not prohibit you from doing so. However, keep in mind that your customer might get a little ticked off if you tell the world via his logbooks that his aircraft is unairworthy. The way I would handle it is I would list the discrepancies on the aircraft's work order, duplicate the statement in the log that declares the aircraft unairworthy, and have the owner or operator sign the work order.
Another question that always pops up is:

In what logbook does the FAA want the "annual" inspection signed off?
Answer: Since you are signing off the entire aircraft, I would put the "annual inspection sign off" in the airframe logbook. This makes sense because over the course of time, engines and propellers, and their respective logbooks come and go, but the airframe logbooks stay with the aircraft over its lifetime.

A final thought
As an FAA airworthiness inspector, I have seen my share of logbooks, and have researched many of them in depth after accidents. Based on this experience I have noticed something that I cannot prove by scientific fact, or find statistically viable, but have usually found to be true.
What I have noticed is that if a handwritten logbook entry is neat, well organized, readable, and signed with pride, you can be confident that 99 times out of 100 the work performed is airworthy. Sadly, I have observed that the reverse is also true.
Simply put, I have found that the way we autograph our work, is subconsciously a reflection of that work.